

# Arpita Vats

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## Education

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### **Santa Clara University**

PhD in Computer Science (Incomplete) — September 2021 - September 2023

- Relevant Coursework: Computer Vision, Deep Learning, Reinforcement Learning, Generative AI, Large-Scale Machine Learning, Probabilistic Graphical Models, Natural Language Processing.

### **Boston University**

Master's in Computer Science — January 2016 - May 2018

- Relevant Coursework: Computer Vision, Deep Learning, Machine Learning, Data Mining, Neural Networks, Big Data Analytics, Cloud Computing, Distributed Systems, Algorithm Design.

### **Rajiv Gandhi Technical University**

Bachelor's in Computer Science — March 2011 - June 2015

- Relevant Coursework: Computer Graphics, Operating Systems, Algorithms and Data Structures, Compiler Theory, Database Management Systems, Artificial Intelligence, Software Engineering, Cryptography and Network Security.

## Experience

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### **Senior AI Engineer** - LinkedIn

Sunnyvale, CA — April 2024 - Present

- Developed and optimized video recommendation models to enhance engagement and relevance in LinkedIn's Feed using cutting-edge machine learning techniques and large-scale distributed systems.
- Leveraged Large Language Models (LLMs) to improve content understanding, personalization, and ranking within the recommendation pipeline.

### **Senior Machine Learning Engineer/Researcher** - Staples

Remote — September 2023 - April 2024

- Developed a semantic matching pipeline utilizing Large Language Models (LLMs) and Hybrid Search with data from both competitors and Staples.
- Designed a product recommendation system based on user behavior, leveraging LLMs to improve personalized shopping experiences.

### **Research Scientist** - MIT Media Labs

Cambridge, MA — August 2019 - November 2020

- Developed privatization techniques for activation functions to enhance security in machine learning models.
- Created a regression-based prediction model using Support Vector Machines (SVM) to estimate final performance of partially trained neural networks based on architecture and hyperparameter features.

## Internships

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### **Research Scientist Intern** - Meta

Menlo Park, CA — May 2023 - September 2023

- Researched techniques to recover private masked data using Large Language Models.
- Fine-tuned models like LLaMA, LLaMA-2, and LLaMA-2-Chat to improve data recovery capabilities.
- Published research in ICASSP 2024 on privacy-preserving methods for LLM-based text generation.

**Applied Scientist Intern** - Amazon  
Cambridge, MA — May 2022 - September 2022

- Designed a neural network using contrastive learning for Alexa to recognize wake words from various media sources.
- Developed an algorithm that reduced search latency by 80% compared to the previous approach.
- Evaluated search performance using the FAISS algorithm developed by Meta.

## Graduate Researcher

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**Research Assistant** - Santa Clara University  
Santa Clara, CA — January 2022 - May 2022

- Conducted advanced machine learning research on Computer vision and NLP including data pre-processing, model development, and performance evaluation using Python, PyTorch, and academic datasets.
- Co-authored technical reports and contributed to peer-reviewed publications by designing experiments, analyzing results, and integrating feedback for improving model robustness and generalizability.

## Publications (130+ Citations)

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- [1] **A. Vats**, DC Anastasiu, “Enhancing Retail Checkout Through Video Inpainting, YOLOv8 Detection, and DeepSort Tracking,” *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2023. **Cited by:** 34.
- [2] B Kiefer, M Kristan, J Perš, L Žust, F Poiesi, F Andrade, A Bernardino, ... “1st Workshop on Maritime Computer Vision (MaCVi) 2023: Challenge Results,” *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision*, 2023. **Cited by:** 28.
- [3] **A. Vats**, V Jain, R Raja, A Chadha, “Exploring the Impact of Large Language Models on Recommender Systems: An Extensive Review,” *arXiv preprint arXiv:2402.18590*, 2024. **Cited by:** 17.
- [4] **A. Vats**, DC Anastasiu, “Key Point-Based Driver Activity Recognition,” *Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition*, 2022. **Cited by:** 17.
- [5] **A. Vats**, Z Liu, P Su, D Paul, Y Ma, Y Pang, Z Ahmed, O Kalinli, “Recovering from Privacy-Preserving Masking with Large Language Models,” *arXiv preprint arXiv:2309.08628*, 2023. **Cited by:** 13.
- [6] **A. Vats**, R Raja, V Jain, A Chadha, “The Evolution of Mixture of Experts: A Survey from Basics to Breakthroughs,” *Preprints (August 2024)*, 2024. **Cited by:** 6.
- [7] M Morales, R Barbar, D Gandhi, S Landage, J Bae, **A. Vats**, J Kothari, ... “COVID-19 Tests Gone Rogue: Privacy, Efficacy, Mismanagement and Misunderstandings,” *arXiv preprint arXiv:2101.01693*, 2021. **Cited by:** 5.
- [8] **A. Vats**, “Estimation of Warfarin Dosage with Reinforcement Learning,” *arXiv preprint arXiv:2109.07564*, 2021. **Cited by:** 4.
- [9] **A. Vats**, A Chadha, “Facial Expression Recognition using Squeeze and Excitation-powered Swin Transformers,” *ICVISIP*, 2023. **Cited by:** 3.
- [10] **R. Raja**, **A. Vats**, “Parallel Corpora for Machine Translation in Low-resource Indic Languages: A Comprehensive Review,” *arXiv preprint arXiv:2503.04797*, 2025.
- [11] **A. Vats**, R Raja, M Mathur, V Jain, A Chadha, “Multilingual State Space Models for Structured Question Answering in Indic Languages,” *arXiv preprint arXiv:2502.01673*, 2025.
- [12] **A. Vats**, R Raja, “Advancing Vision-Language Models with Generative AI,” 2025.

- [13] **A. Vats**, R Raja, V Jain, A Chadha, "The Evolution of Mixture Of Experts: From Basics To Breakthroughs," *Towards AI*, 2024.
- [14] **A. Vats**, G Guzun, DC Anastasiu, "CLP: A Platform for Competitive Learning," *European Conference on Technology Enhanced Learning*, 2022.
- [15] **A. Vats**, "Understanding Hand-Gestures Using Convolutional Neural Networks and Generative Adversarial Networks," *arXiv preprint arXiv:2011.04860*, 2020.
- [16] **A. Vats**, A Chadha, "Multi-Class Product Counting and Recognition for Automated Retail Checkout: A Review," 2022.
- [17] **A. Vats**, "Similarity Search: FAISS, ScaNN, ANNOY," 2022.

## Patents

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- **Dwell Time Optimization for Personalized Content Ranking - (504250-US01)** [2025]  
Developed a well time optimization framework at LinkedIn, leveraging advanced machine learning and ranking models to improve user engagement and recommendation effectiveness.

## Key Projects

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- **RNN for Predicting Movie Review Sentiments**  
*Deep Learning, NLP — PyTorch, NLTK*  
Developed predictive RNN models that determine whether a given movie review is positive or negative. Built and trained an RNN model to predict sentiment for 25,000 movie reviews, where positive sentiment is represented by +1 and negative sentiment by -1.
- **Object Detection for Street Objects**  
*Computer Vision — PyTorch, YOLOv6, Transfer Learning*  
Built a predictive model to detect and localize seven different types of street objects using bounding boxes. Employed transfer learning with the YOLOv6 pre-trained model to improve object detection accuracy.
- **Deep Learning-Based Audio Clustering Methods**  
*Unsupervised Learning — PyTorch, AutoEncoders, K-Means*  
Explored different audio feature extraction techniques and converted audio samples into spectrograms. Trained an autoencoder model to compress and reconstruct spectrograms, then applied K-Means clustering to group audio samples into 20 clusters.
- **Deep Reinforcement Learning: Atari Pong**  
*Reinforcement Learning — PyTorch, Q-Learning, DQN*  
Developed a deep reinforcement learning technique to train an agent to play Atari Pong using Deep Q Networks (DQN). The proposed approach was recognized as the best method in the final RL project.
- **Connect 4 Game using RL Algorithms**  
*Reinforcement Learning — PyTorch, Q-Learning*  
Implemented an RL-based approach using SARSA Q-Learning for the Connect 4 game. Participated in a class competition where the model competed against other students' implementations.
- **Splintering with Distributions: A Stochastic Decoy Scheme for Private Computation**  
*Federated Learning, Privacy-Preserving ML — PyTorch, Federated Learning*  
Proposed a stochastic scheme for privatizing client data using distributed shares. The server performed computations on privatized shares instead of raw client data, ensuring privacy, and intermediate results were reassembled at the client-side.

## Delivered/Invited Talks

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- **CVPR 2022 and 2023**  
Delivered a talk on advancing retail checkout automation using video inpainting, YOLOv8 detection, and DeepSort tracking, along with key point-based driver activity recognition.

- **ODSC West 2024**  
Delivered a talk on harnessing large language models (LLMs) for next-generation recommendation systems.
- **Data Science Salon 2024**  
Participated in a panel discussion on the role of generative AI and machine learning in enterprise applications.
- **Generative AI World Summit 2024**  
Delivered a talk on integrating large language models (LLMs) in vision systems.
- **Queens of Tech Podcast 2025**  
Delivered a podcast on my journey into AI, career decisions, challenges, and advice for women in tech.
- **Optimized AI Conference 2025**  
Scheduled to present on AI agents and optimization, highlighting their growing impact on autonomous systems and enterprise AI.
- **Women Impact Tech (July 2025)**  
Scheduled to present on the future of generative AI in vision and recommendation models and its transformative impact.
- **Women Tech Networks (June 2025)**  
Scheduled to deliver a talk on mixture of experts in vision models and their role in improving AI-driven perception.
- **AI4 Conference (August 2025)**  
Scheduled to participate in a panel discussion on optimizing data extraction and evaluation techniques for computer vision.
- **AI2030 Show (April 2025)**  
Featured podcast guest discussing scaling generative AI models for improved performance and efficiency.
- **MLOps Community (March 2025)**  
Invited as a podcast guest to discuss scalability and optimization of AI models in production environments.

## **Reviewer/Program committee member**

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- **ACM Computing Surveys**, 2025  
Reviewer for ACM Computing Surveys, one of the top journals in Computer Science, ranked 1/143 in Computer Science Theory and Methods, with an impact factor of 23.8.
- **ICLR (International Conference on Learning Representations)**, 2025  
Reviewer for ICLR, one of the top three AI conferences, known for cutting-edge research in deep learning, large language models (LLMs), and generative AI. In 2024, ICLR had over 8,000 paper submissions.
- **NAACL (North American Chapter of the Association for Computational Linguistics)**, 2025  
Reviewer for NAACL, a premier NLP conference, focusing on linguistic diversity, multilingual AI, and low-resource languages.
- **CVPR (Conference on Computer Vision and Pattern Recognition)**, 2025  
Reviewer for CVPR, one of the most prestigious computer vision conferences, showcasing breakthroughs in AI-driven vision technologies.
- **ICCV (International Conference on Computer Vision)**, 2022  
Reviewer for ICCV, one of the premier international conferences on computer vision, covering deep learning, scene understanding, and generative models.

- **WACV (Winter Conference on Applications of Computer Vision)**, 2024  
Reviewer for WACV, a top-tier conference focused on real-world applications of computer vision, deep learning, and AI-driven image processing.
- **RecSys (ACM Conference on Recommender Systems)**, 2024 - 2025  
Reviewer for RecSys, the leading conference for research in personalized recommendations, user modeling, and AI-driven recommendation systems.
- **KDD (Knowledge Discovery and Data Mining)**, 2024 - 2025  
Reviewer for KDD, one of the top data science and machine learning conferences, emphasizing advances in large-scale data analytics, graph mining, and AI-driven decision-making.
- **IEEE Multimedia**, 2025  
Reviewer for IEEE Multimedia, a leading journal in AI-driven multimedia systems, computer vision, and deep learning applications for multimodal data processing.
- **ACCV (Asian Conference on Computer Vision)**, 2024  
Reviewer for ACCV, a top conference focused on computer vision, AI ethics, and ML model optimization.
- **NeurIPS (Neural Information Processing Systems)**, 2025  
Reviewer for NeurIPS, a top conference focused on Neural Information Processing Systems is a machine learning and computational neuroscience
- **Invited to Judge HackDavis Hackathon at UC Davis (April 2025)**  
Selected as a judge for HackDavis 2025, one of the largest collegiate hackathons, evaluating innovative AI and tech-driven projects.

## Organizers/Ambassadors

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- **CVPR 2025 Workshop Organizer and Committee Member**  
Serving as an organizer and committee member for CVPR DriveX - Foundation Models for V2X-Based Cooperative Autonomous Driving, a workshop at CVPR 2025.
- **DataScience Next Conference Committee Member**  
Contributing as a committee member for DataScience Next Conference, supporting discussions on cutting-edge advancements in AI and data science.
- **AI Frontier Network Ambassador**  
Representing the AI Frontier Network as an ambassador, promoting advancements in AI research and fostering collaboration within the AI community.
- **Grace Hopper Celebration (GHC) Mentor**  
Actively mentoring aspiring women in technology as part of the \*\*Grace Hopper Celebration (GHC) mentorship program.

## Media Coverage

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- **WiML (Women in Machine Learning)**  
Recognized by WiML (Women in Machine Learning) for contributions to AI research and advocacy in machine learning. WiML is a globally recognized community that supports and promotes women in machine learning through mentorship, networking, and research visibility. The recognition highlighted my work in recommender systems, large-scale AI infrastructure, and multimodal AI, as well as my role in mentoring and supporting women in AI.

## Technical Skills

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- **Programming Languages:** Java, Python, C/C++, SQL (PostgreSQL), JavaScript, HTML/CSS, R.

- **Frameworks and Libraries:** PyTorch, Keras, TensorFlow, Pandas, NumPy, OpenCV, OpenFace, Flask, FastAPI, React, Node.js, WordPress.
- **Machine Learning and AI:** Deep Learning, Large Language Models (LLMs), Recommender Systems, Generative AI, Natural Language Processing (NLP), Computer Vision.
- **Developer Tools and Platforms:** Git, Docker, Kubernetes, Google Cloud Platform (GCP), AWS, Azure, TravisCI, VS Code, PyCharm, IntelliJ, Eclipse.
- **Data Processing and Analytics:** SQL, BigQuery, Apache Spark, Hadoop, Elasticsearch, Data Mining.